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November 10, 1992

Mr. David Croxton  
EPA Project Coordinator  
U.S. EPA  
1200 Sixth Avenue, M/S HW-106  
Seattle, WA 98101

Mr. Croxton:

Attached is the Bimonthly Progress Report required by the 3008(h) Order for RFI activities completed at the Burlington Environmental Inc. Pier 91 Facility for the months of September and October 1992.

If you have any questions or require further information, please contact me at (206) 223-7596.

Sincerely,

John Stiller  
Project Coordinator

cc: Barb Smith, Ecology NWRO

USEPA RCRA



3012350



## MEMORANDUM

DATE: November 9, 1992

TO: Dave Haddock      Mel Miller  
Nate Mathews      John Stiller

FROM: Joe Depner *JD.*

SUBJECT: RFI PROGRESS REPORT, PIER 91 FACILITY, AUGUST 1992 TO OCTOBER 1992

This memo summarizes the progress of the RCRA Facility Investigation (RFI) for the period from September 1 to October 31, 1992, and represents the second bimonthly progress report for the Pier 91 facility. The 3008(h) order for the Pier 92 facility requires that progress reports be submitted bimonthly until the order is terminated.

### DESCRIPTION AND ESTIMATE OF WORK COMPLETED

Work has begun on the following office tasks:

- historical site evaluation;
- site documentation review; and
- beneficial use survey.

In addition, the following field tasks have been completed:

- site reconnaissance and underground utility search at borehole locations;
- hand augering, soil sampling, and abandonment of boreholes HA-3 through HA-12;
- drilling, soil sampling, and installation of shallow monitoring wells CP-111, CP-112, CP-114, CP-116, CP-117, CP-118, and CP-119;



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- installation of shallow monitoring wells (with DNAPL collection sumps) CP-113, CP-115A, and CP-121;
- development of monitoring wells CP-111, CP-114, CP-115A, and CP-121;
- measurements of water levels and nonaqueous phase liquid (NAPL) levels in monitoring wells;
- sampling of six storm drains and one manhole along the west side of the warehouse; and
- monthly water-level measurements in all monitoring wells.

In addition to the above tasks that were specified in the approved RFI Work Plan, Burlington prepared a response to the USEPA's conditional comments on the RFI Work Plan. The response, which included a pumping test work plan and a tidal monitoring work plan, was submitted to the USEPA on October 7.

On October 20 and 21, the USEPA conducted an RFA/VSI for the entire Port of Seattle property at Piers 90 and 91.

#### SUMMARY OF ALL FINDINGS

Numerous consultant's reports, maps, drawings, and photographs have been acquired as part of the historical site evaluation and site documentation review.

The beneficial use survey focused on the circular area centered at the Pier 91 facility and having a 0.5-mile radius as prescribed in the RFI Work Plan. No beneficial uses of groundwater have been identified.

The on-site search for underground utilities at the proposed borehole locations revealed an apparent underground water main in the vicinity of borehole CP-121 and underground lines in the area northeast of the oil/water separator.

During site reconnaissance, signs of underground electrical equipment such as lines and vaults were observed along the access road that borders the east side of the facility. These signs include manholes and narrow (1-2 feet wide) strips of repaired asphalt surface.

Soils encountered during hand augering ranged in grain size from medium sand to coarse gravel with cobbles. All soil samples collected from the ten hand auger boreholes appeared to be

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contaminated with a viscous, black, oily substance having a visible sheen and a petroleum-like odor. The depth to ground water ranged from approximately 6.5 to 7 feet below ground surface (bgs) in those hand-augered boreholes where ground water was encountered.

Most soils encountered during drilling of shallow wells ranged from fine sand to medium gravel. However, a sandy silt layer was encountered at depths ranging from approximately 15 to 22 feet bgs in boreholes CP-111, CP-112, CP-113, CP-115A, and CP-121. The depth to groundwater in the shallow wells ranged from approximately 5.5 to 7.5 feet bgs.

Light nonaqueous phase liquids (LNAPLs) were detected in seven of the monitoring wells. These results are summarized in Table 1. All depths were measured relative to the tops of the well casings.

Monitoring wells CP-111, CP-114, and CP-115A have been developed. At the end of the reporting period, development of monitoring well CP-121 had begun but was not yet complete.

Six storm drains/sumps and one manhole along the west side of the warehouse, near the oil/water separator were sampled. The manhole and all of the drains are brick lined. The drains and manhole appear to be connected in series via pipes. The six drains are rectangular in cross section, approximately 1.5 feet wide by 2 feet long, and approximately 3.5 feet deep (bgs). These drains contained approximately 2.5 feet of standing water. The manhole is circular in cross section, with a diameter of about 3 feet, and is approximately 6 feet deep (bgs). The manhole contained approximately 3.5 to 4 feet of standing water. All of the drains and the manhole contained dark-brown to black, opaque, viscous, oily sludge. One sample of sludge was collected from each of the seven locations.

#### SUMMARY OF ALL PROBLEMS ENCOUNTERED

While attempting to hand auger borehole HA-4, a buried pipe was encountered at depth of approximately 1 foot bgs. The surface concrete was cored in an area nearby and a second attempt was made. Two samples were collected from this borehole, from approximate depths of 1.5 to 2, and 3 to 3.5 feet bgs. Due to continual collapse of the borehole, representative samples could not be obtained from depths greater than 3.5 feet bgs.

While attempting to hand auger borehole HA-7, refusal occurred at a depth of approximately 4 feet when large cobbles were encountered. The two samples obtained were from depths of approximately 1.5 to 2, and 3 to 3.5 feet bgs.



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Refusal occurred at a depth of approximately 10 inches bgs in borehole HA-9 when buried concrete was encountered. The surface concrete was cored nearby for a second attempt. During a second attempt, buried concrete caused auger refusal at a depth of approximately 1.5 feet bgs. The surface concrete was cored for a third attempt.

Refusal occurred in the third borehole at a depth of approximately 2 feet bgs due to buried concrete. It was not known whether or not the buried concrete was emplaced to protect underground utilities. Therefore, advancement of the borehole past the buried concrete was deemed imprudent and was not performed. One sample was obtained in the third borehole at the HA-9 location, from a depth of approximately 1.5 to 2 feet bgs.

The location of hand-auger borehole HA-10 proposed in the RFI Work Plan was found to lie within a sump near the center of the black oil yard. The immediate surrounding area is inaccessible due to the presence of piping. With the USEPA's consent, the borehole was drilled approximately 50 feet southwest of the original proposed location.

Refusal occurred in borehole HA-10 at a depth of approximately 2 feet bgs when buried wood debris was encountered. One sample was collected from a depth of approximately 1.5 to 2 feet bgs. After coring the surface concrete at a nearby location, a second attempt was made. Again refusal occurred at a depth of 2 feet bgs, due to buried wood debris. The surface concrete was cored in a third location, and this attempt resulted in the collection of two samples, from depths of approximately 4.5 to 5, and 5 to 5.5 feet bgs.

The location originally proposed for borehole CP-111 was found to have insufficient overhead clearance to raise the derrick. Also, drilling at that location would have obstructed a heavily used loading dock. With the USEPA's consent, the borehole location was moved to approximately 34 feet west and 13 feet south of the southwest corner of Cold Storage Warehouse W-39.

Mechanical failure of the portable power auger required the use of a hand auger to drill the shallow intervals (from ground surface to the water table) of boreholes CP-116, CP-117, CP-118, and CP-119.

During the drilling of borehole CP-116, for a shallow monitoring well in the small yard, a buried pipe was encountered at a depth of approximately 2 to 3 feet bgs. The borehole was then abandoned. The surface concrete was cored at a new location nearby, and the well was installed.

During the installation of CP-118, the tip of the drive point broke. A second attempt, using a new drive point, was successful.

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During the installation of monitoring well CP-119, the tip of the drive point broke. An attempt was made to drive a new well point at the same location. The screen then broke at a coupling. The screen broke at the couplings during the next two attempts also. A fifth attempt to complete CP-119 was made using a well point with a 7-foot screen section. During this attempt, the rods used to drive the well point to depth became sandlocked in the well point. As a result, the entire well point had to be pulled out of the hole in order to remove the rods. At that point it was discovered that the well point had been twisted during removal. A new well point with a 7-foot screen section was then successfully driven at the same location using thinner drive rods.

The proposed location of monitoring well CP-120 and the surrounding area were found to be inaccessible due to the presence of aboveground piping. Burlington notified the USEPA of this finding and is currently evaluating alternate locations for this well.

At borehole CP-122A (near the proposed monitoring well CP-122B, as amended), some subsidence was noted prior to drilling. During drilling, apparently an obstruction was encountered at approximately 15 feet bgs. The obstruction deflected the auger from its original near-vertical orientation. To realign the auger, the surface opening in the concrete had to be enlarged. After enlarging the opening, a void was observed beneath the surrounding concrete. The visible part of the void was approximately 4 feet wide by 6 feet long, and 2 to 3 feet deep. At that time the decision was made to cease drilling, abandon the borehole and notify the landowner, the Port of Seattle (The Port). Representatives of the Port were notified. Drilling at the Pier 91 facility has been postponed until repairs by the Port are completed.

#### PROJECTED WORK FOR THE NEXT REPORTING PERIOD

- cataloging and summarizing of information obtained during historical site evaluation, site documentation review, and beneficial use survey;
- validation and tabulation of laboratory analysis data, soil samples;
- evaluation of engineering test results on soil samples;
- drilling, soil sampling, and installation of shallow-aquifer monitoring wells CP-120 and CP-122A, and deep-aquifer monitoring wells CP-106B, CP-115B, and CP-122B;
- laboratory permeability testing of samples from the silty-sand layer at the deep boreholes;
- development of new monitoring wells;

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- groundwater sampling of monitoring wells;
- slug testing of new monitoring wells; and
- monthly measurement of water levels in wells.

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Table 1

MEASURED LNAPL LAYER DEPTHS AND  
CALCULATED THICKNESSES IN MONITORING WELLS

Well	Date	Depth to LNAPL (feet)	Depth to Water (feet)	LNAPL Thickness (feet)
CP-103A	10/30/92	NA	6.72	NA
CP-103B	10/30/92	NA	8.16	NA
CP-104A	10/30/92	NA	6.13	NA
CP-104B	10/30/92	NA	6.18	NA
CP-105A	10/30/92	NA	6.40	NA
CP-105B	10/30/92	NA	6.62	NA
CP-106	10/30/92	NA	6.92	NA
CP-107	10/30/92	6.23	6.30	0.07
CP-108A	10/30/92	NA	6.20	NA
CP-108B	10/30/92	NA	8.28	NA
CP-109	10/30/92	7.25	7.79	0.54
CP-110	10/30/92	6.07	6.62	0.55
CP-111	10/13/92	NA	8.91	NA
CP-112	10/28/92	NA	5.96	NA
CP-113	10/28/92	NA	6.20	NA
CP-114	10/23/92	NA	6.35	NA
CP-115A	10/28/92	NA	6.20	NA
CP-116	10/13/92	6.58	6.59	0.01
CP-117	10/13/92	6.69	7.57	0.88
CP-118	10/13/92	6.40	6.46	0.06
CP-119	10/13/92	5.33	6.10	0.77
CP-121	10/26/92	NA	6.20	NA

NA = Not Applicable/Not Found

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